ELECTRONIC MUSICAL INSTRUMENT

RHYTHM ARRANGER
TR-66

SERVICE NOTES

THE SECOND EDITION
Printed in Japan '76. Nov

Roland

CONTENTS

SECTION 1. SPECIFICATIONS

* RHYTHMS : 27 --- WALTZ, JAZZ WALTZ, SLOW ROCK, BOSSA-NOVA, SAMBA, MAMBO, CHA-CHA, BEGUINE, RHUMBA.
"ROCK Beat ....."
ROCK-1, ROCK-2, ROCK-3, ROCK-4 and ROCK-6.
"2 Beat ....."
BASS and SNARE DRUM, FOX TROT-1, SWING-1, MARCH, PARADE, HABANERA.
"4 Beat ....."
BASS and SNARE DRUM, FOX TROT-2, SWING-2, SWING-3, SHUFFLE, TANGO.

* RHYTHM MODE SELECTOR (ARRANGEMENTS) : VARI. A
AUTO
VARI. B

* VOICES : 10 --- BASS DRUM, HIGH CONGA, LOW BONGO, HIGH BONGO, COW BELL, RIM SHOT, CLAVES, SNARE DRUM, HI-HAT(MARACAS), CYMBAL.

* CONTROLS : VOLUME(With power switch), BALANCE, TEMPO RATE, START/STOP.

* PILOT LAMP : LED(Used as both power and tempo pilot lamp.)

* OUTPUT JACK : HIGH IMPEDANCE --- 100K.250PF
LOW IMPEDANCE --- 10K ohms

* FOOT SWITCH JACK : START/STOP .....for DP-1

* AC VOLTAGE : 100V, 117V, 220V, 230V, 240V, 50/60 Hz

POWER CONSUMPTION : 4 W

* DIMENSIONS : 230mm(W) x 267mm(D) x 162mm(H)

* WEIGHT : 4 Kgs

* CABINET FINISH : PRINTED PLYWOOD FINISH

* ACCESSORY : CONNECTION CORD (2.5m with Pin-Plug adaptor)

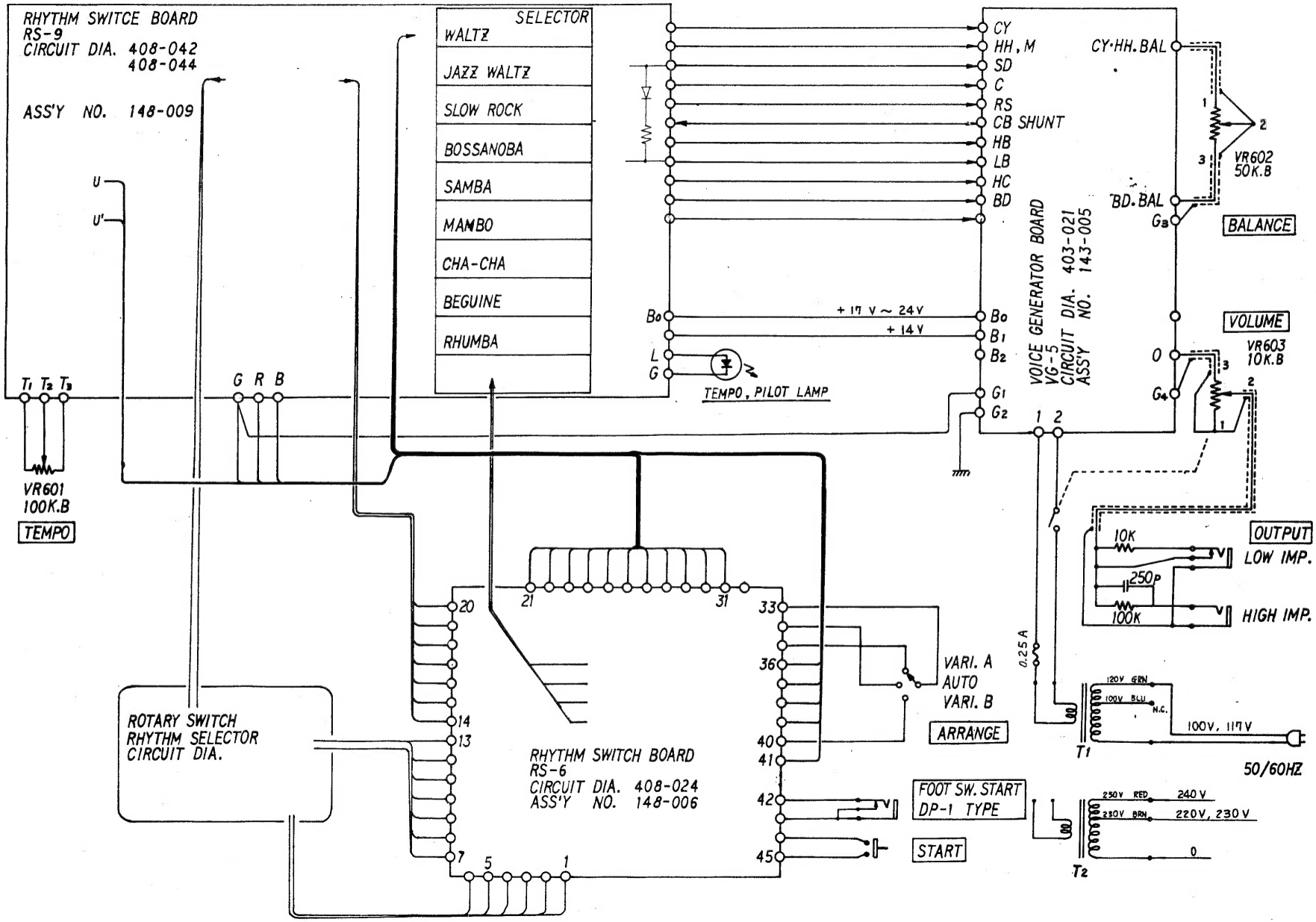
SECTION 2. DISASSEMBLING

Remove 4 screws on the bottom, and the chassis can be pulled out of the cabinet.

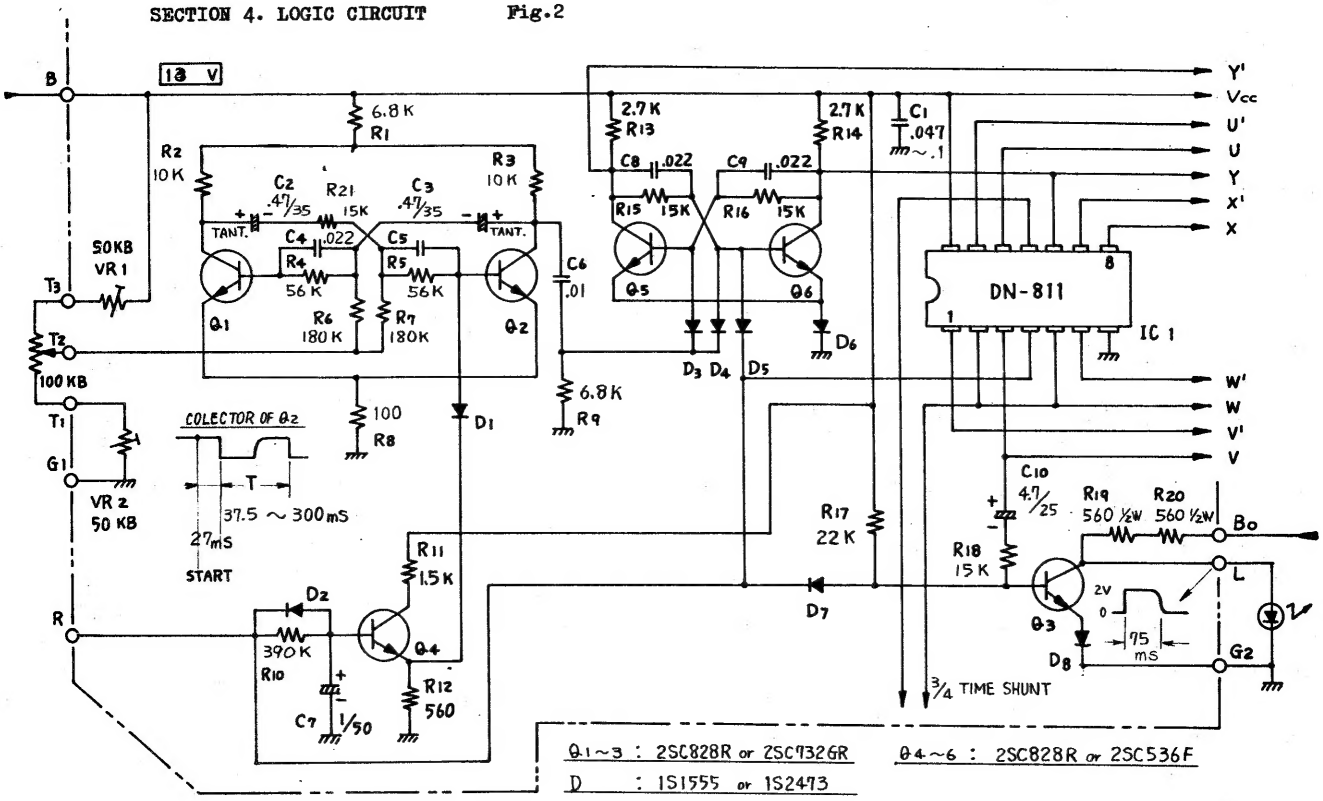
Note : The manufucture holds the right of changing any kind of component parts for improvement with or without previous notice.

SECTION 3. GENERAL BLOCK DIAGRAM

Fig. 1

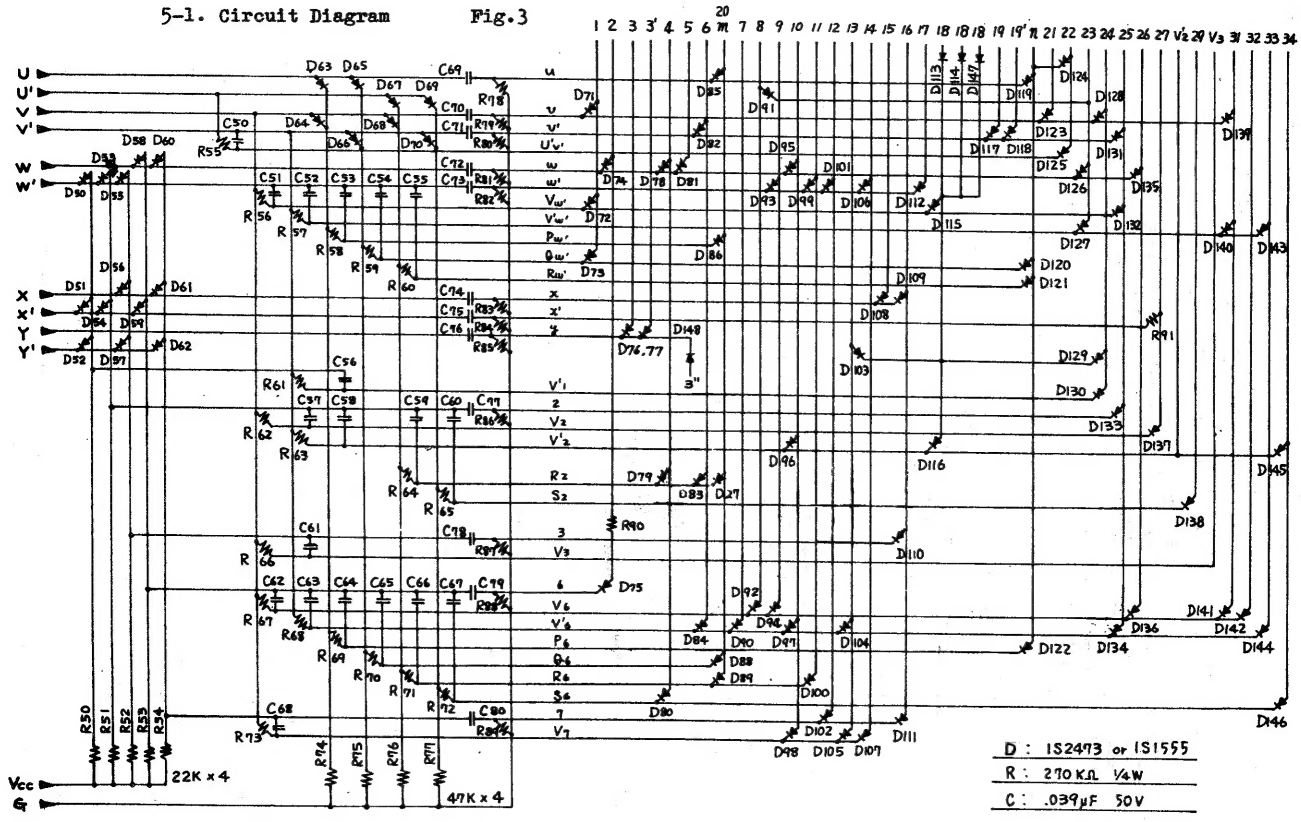


SECTION 4. LOGIC CIRCUIT Fig.2

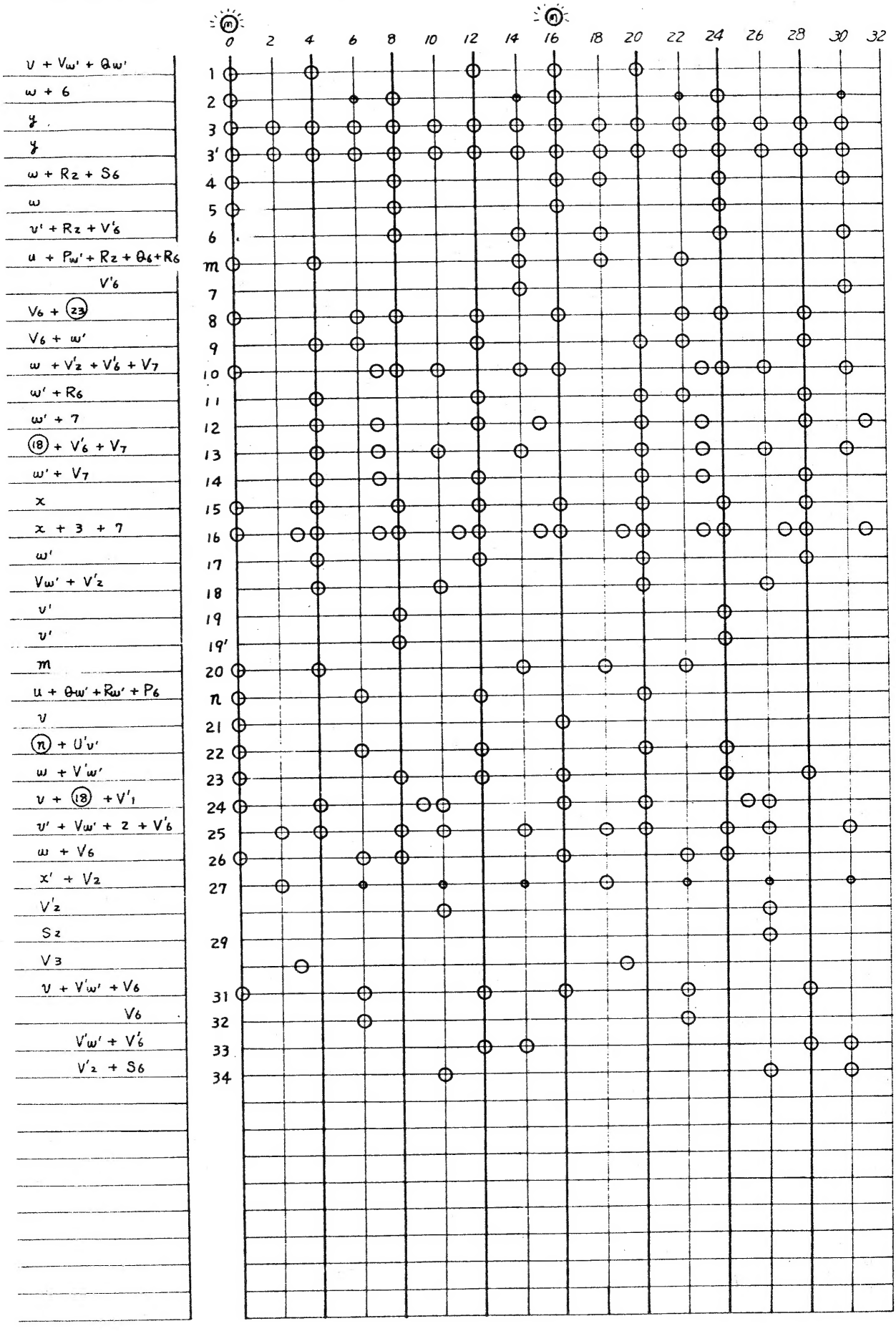


SECTION 5. MATRIX CIRCUIT

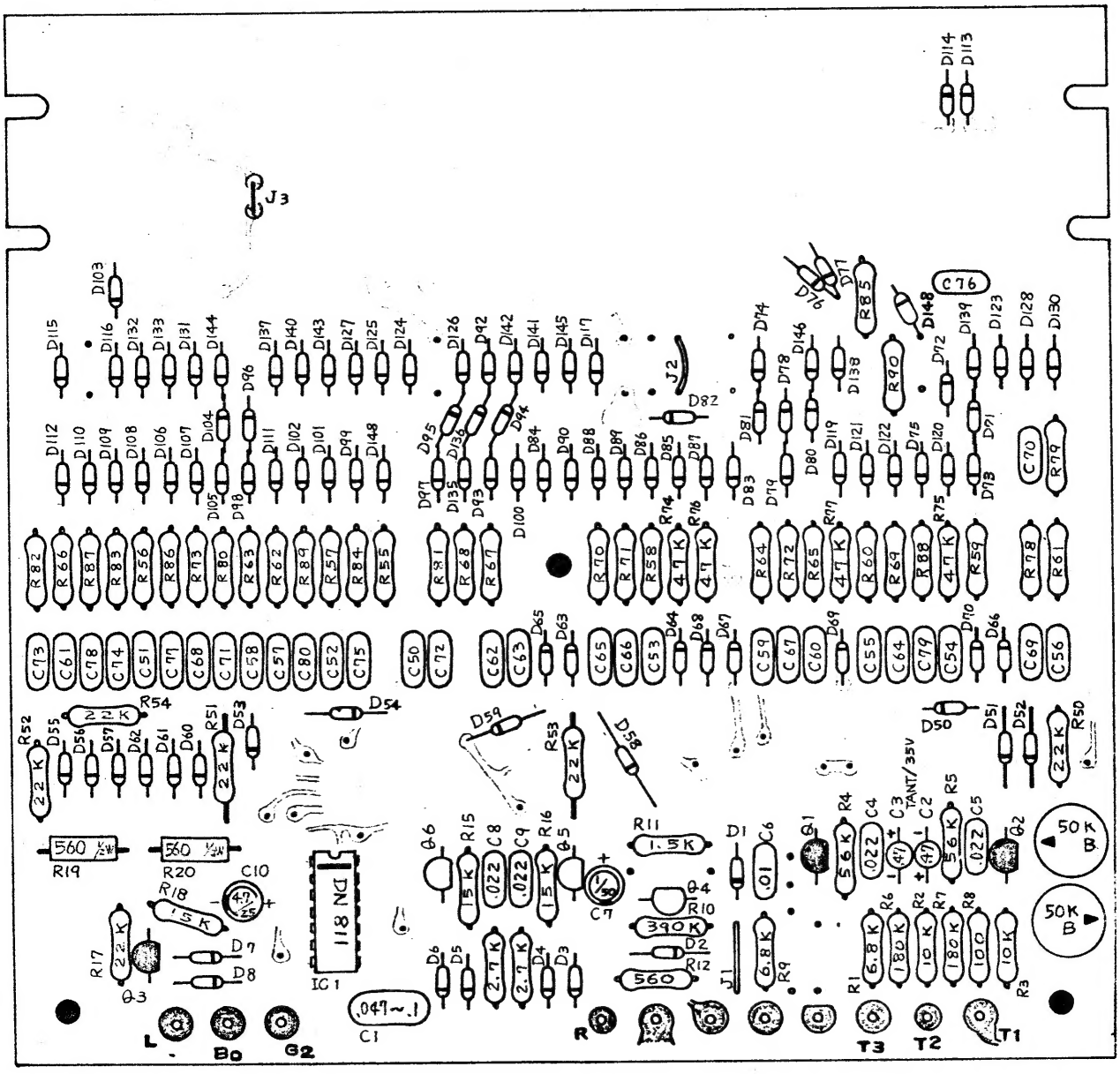
5-1. Circuit Diagram Fig.3



5-2. Logic Output Timing Chart Fig.4



SECTION 6. RHYTHM SWITCH ASSEMBLY PARTS LAYOUT (RS-9) Fig.5



UNLESS OTHERWISE SPECIFIED :

D.	1S2473 or 1S1555
R.	270KΩ ¼W
C.	.039μF 50V
Tr.	2SC828R or 2SC732GR
Tr	2SC536F or 2SC828R or 2SC945P

Fig.6

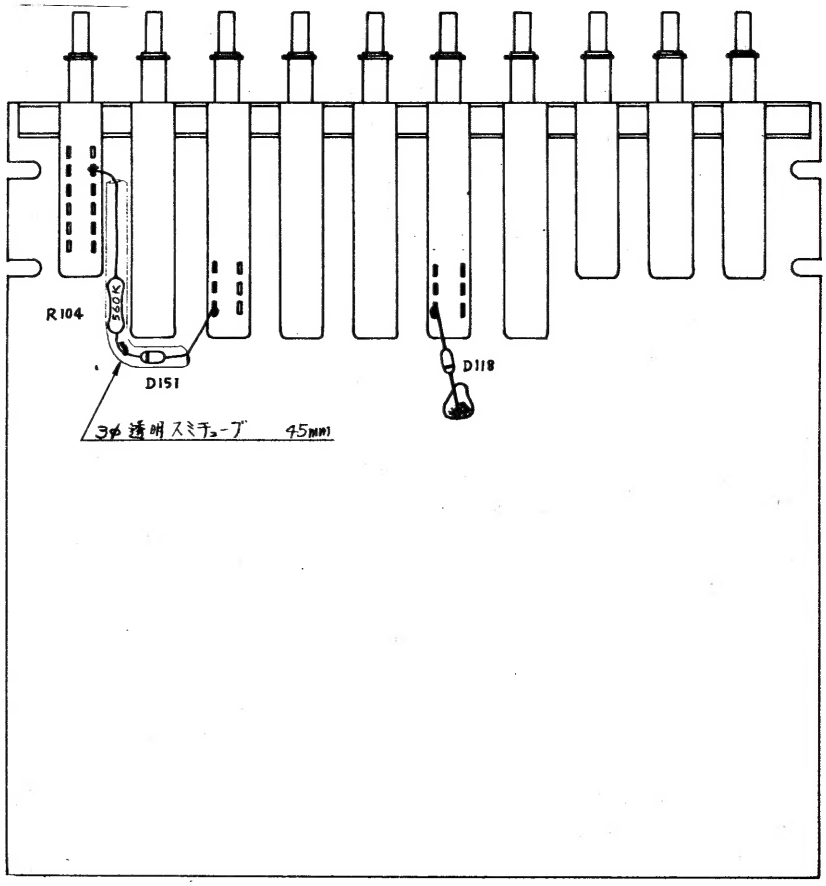
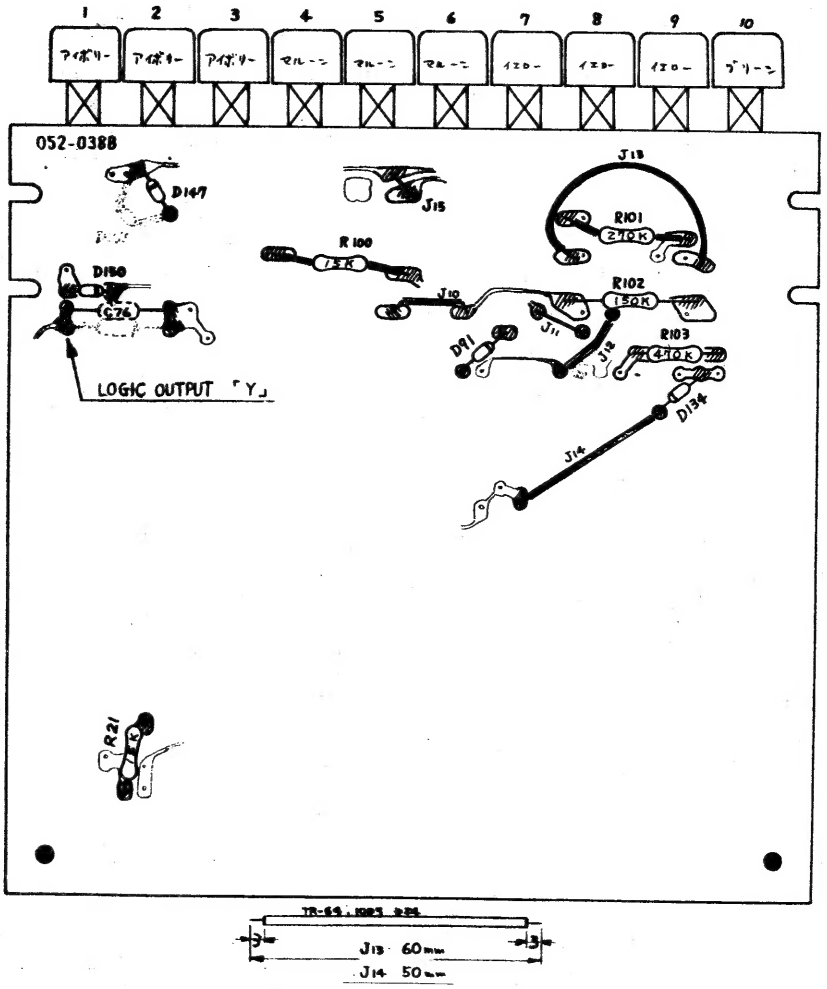
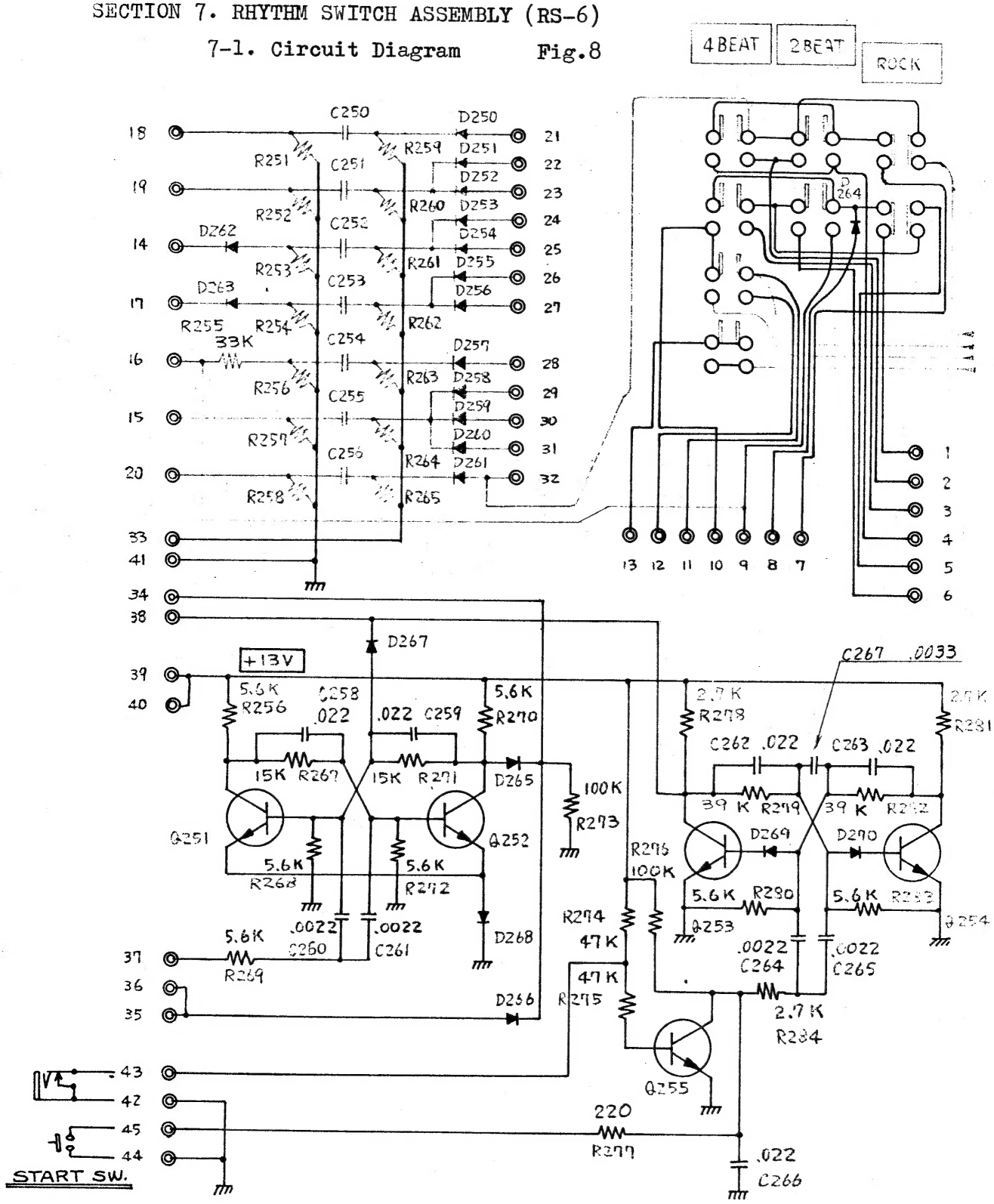

R104
560K
D151
D118
3φ 透明スミチューブ 45mm

Fig.7


1
2
3
4
5
6
7
8
9
10
アイボリー
アイボリー
アイボリー
マルーン
マルーン
マルーン
イエロー
イエロー
イエロー
グリーン
052-0388
D147
J15
J13
R101
270K
R100
15K
D150
(Z4)
J10
R102
150K
J11
D91
J12
R103
470K
D134
J14
LOGIC OUTPUT 「Y」
R21
TR-69, 1083 B-24
J13 60mm
J14 50mm

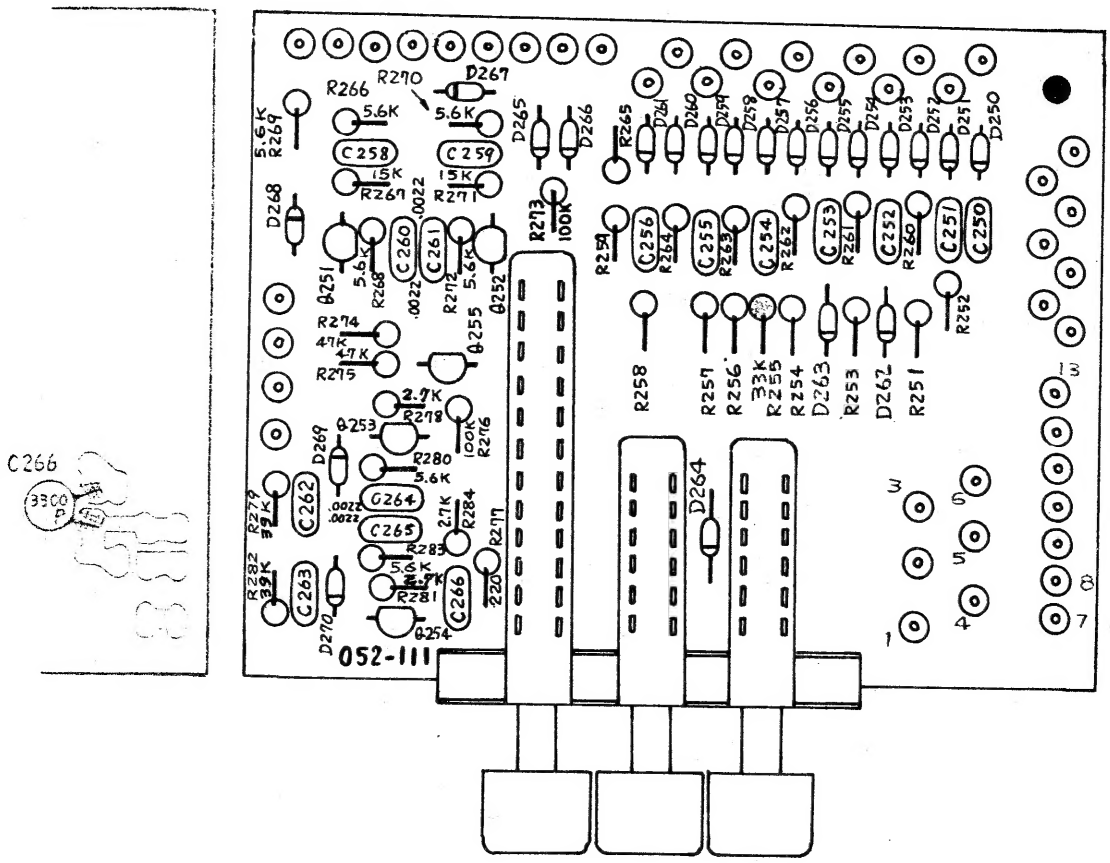
SECTION 7. RHYTHM SWITCH ASSEMBLY (RS-6)

7-1. Circuit Diagram Fig.8



Q	:	2SC536F or 2SC945P or 2SC828R
D	:	1S1555 or 1S2473
R	:	1MΩ ¼W
C	:	.022μF 50V

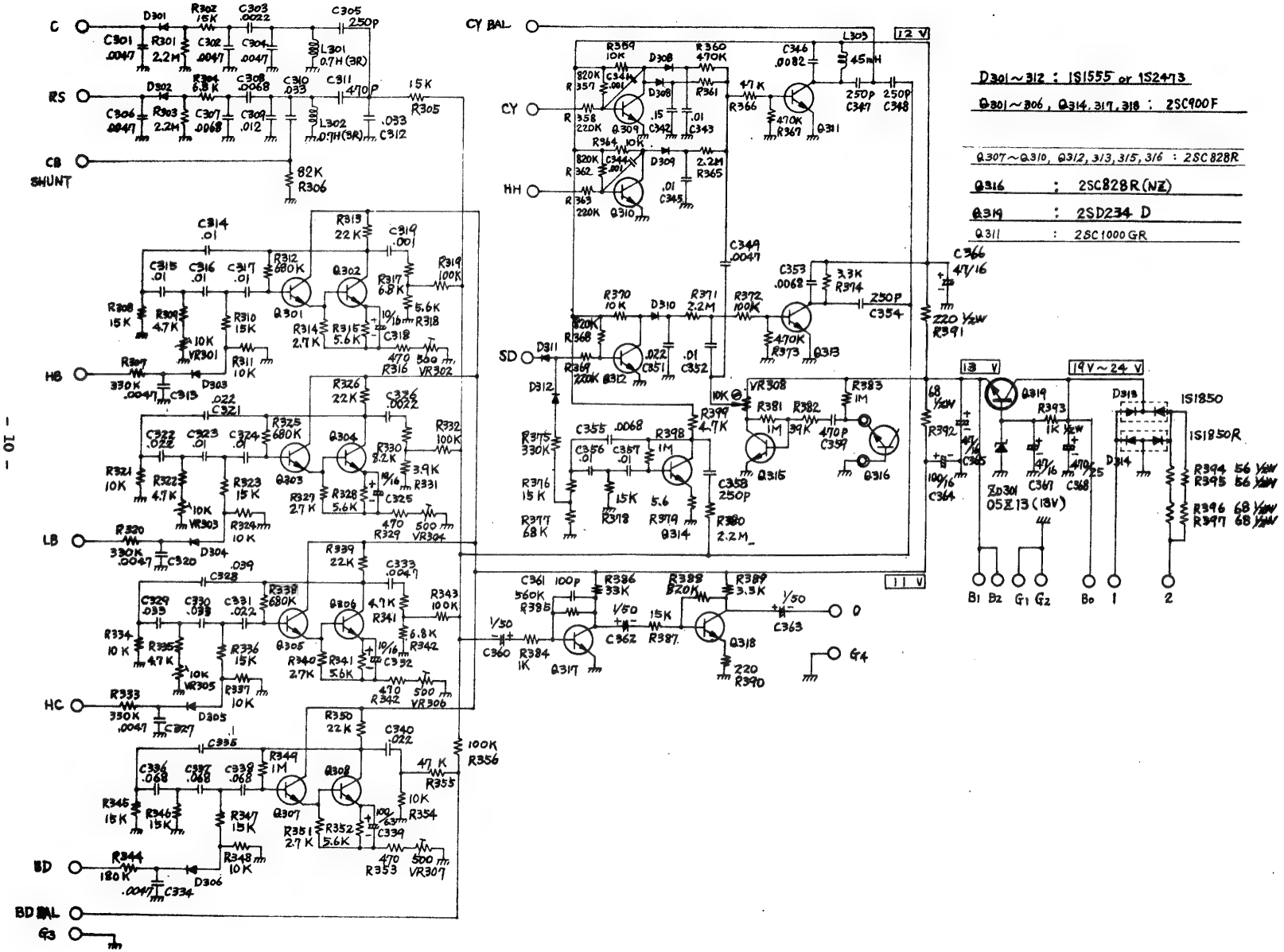
7-2. Parts Layout Fig.9



Q	:	2SC536F or 2SC945P or 2SC828R
D	:	1S1555 or 1S2473
R	:	1 M 1/4 W
C	:	.022 μ 50V

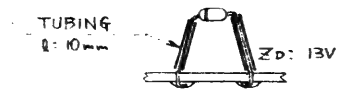
SECTION 8. VOICE GENERATOR AND POWER SUPPLY CIRCUIT (VG-5)

8-1. Circuit Diagram Fig. 10



8-2. Parts Layout

Fig. 11



Q301 ~ 306, Q314, 317, 318 : 2SC900F

Q307 ~ 313, 315, 316 : 2SC828R

Q316 : 2SC828R-NZ

D301 ~ 316 : 1S1555, 1S2473

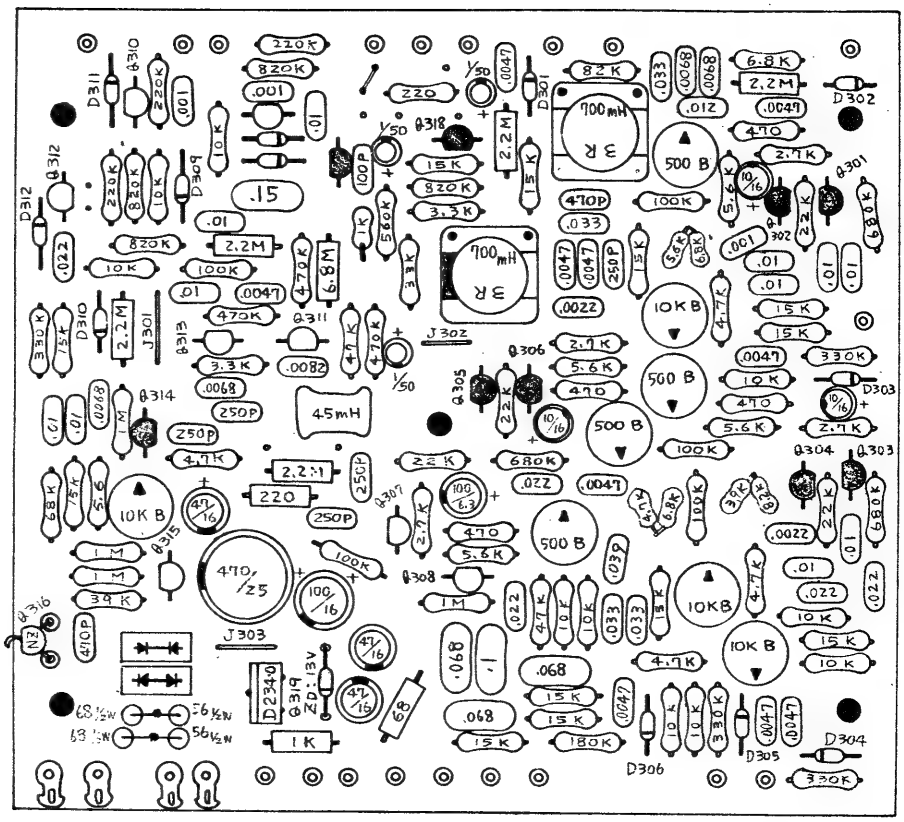
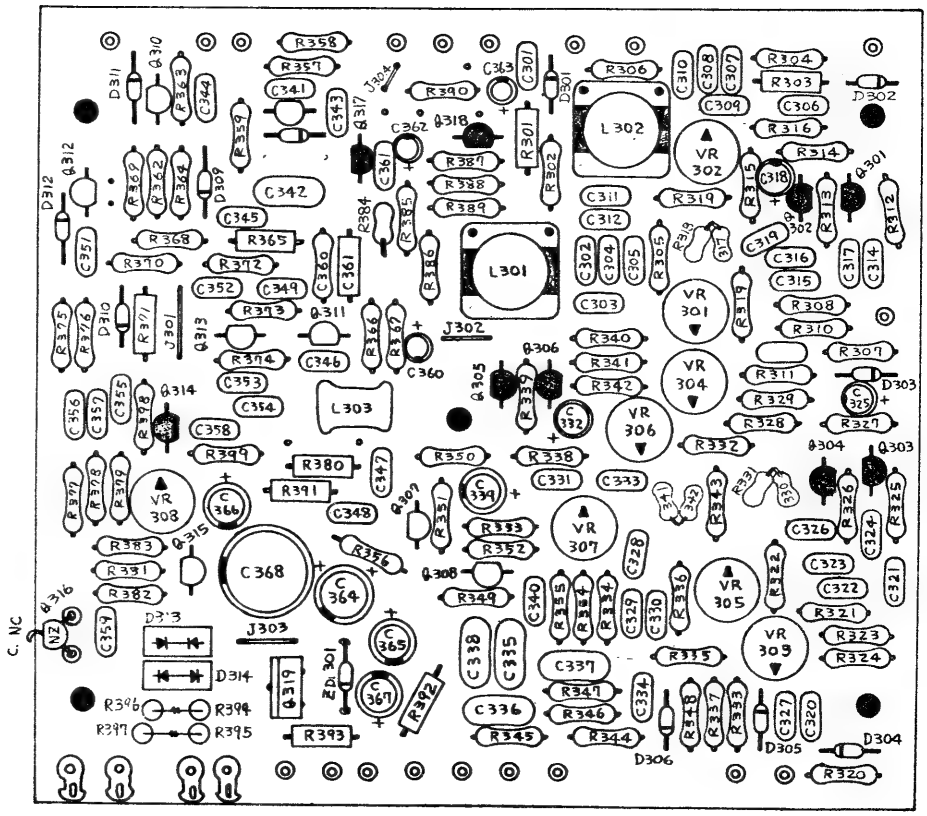
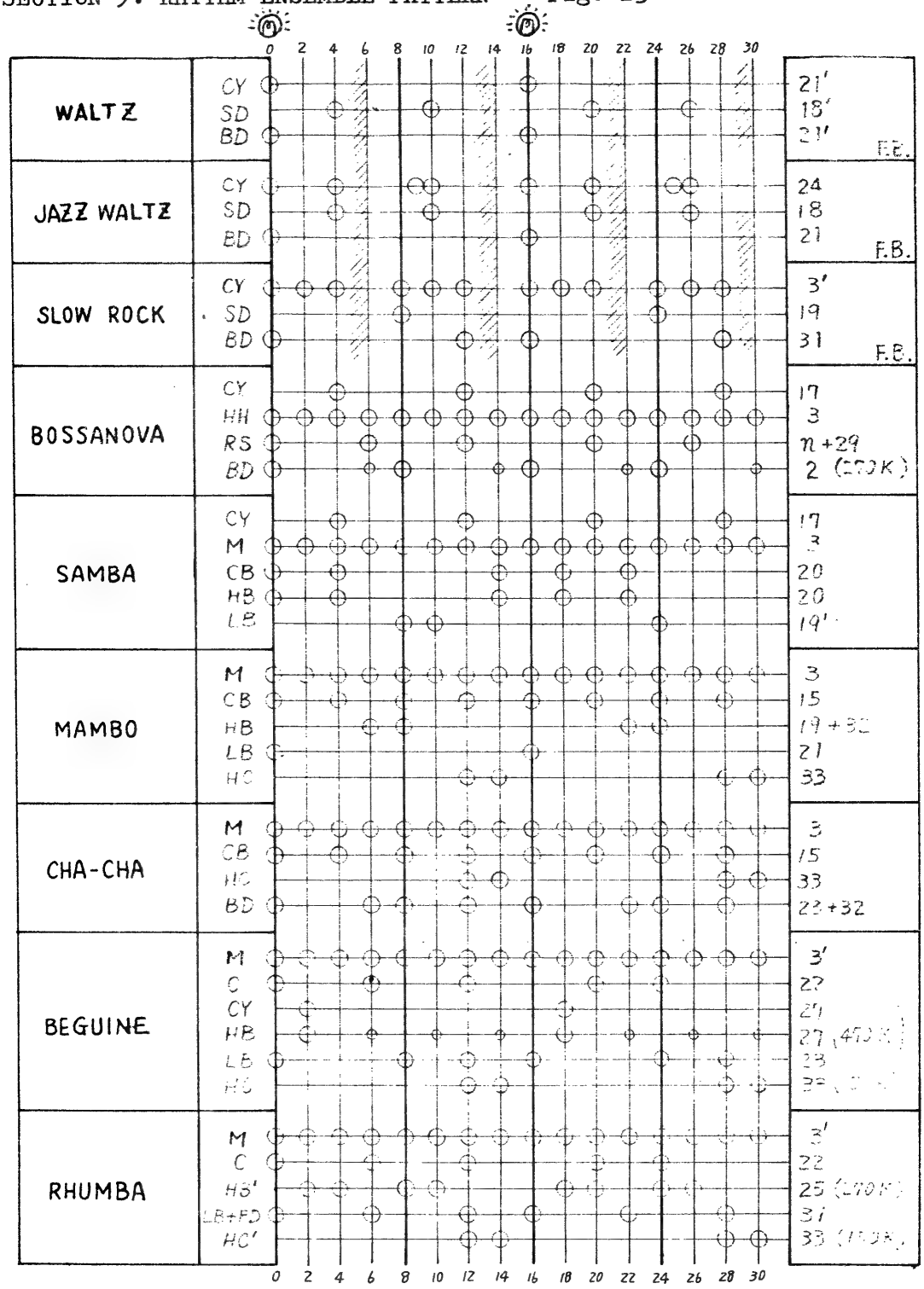


Fig. 12



SECTION 9. RHYTHM ENSEMBLE PATTERN Fig. 13



M = HH

Fig. 14

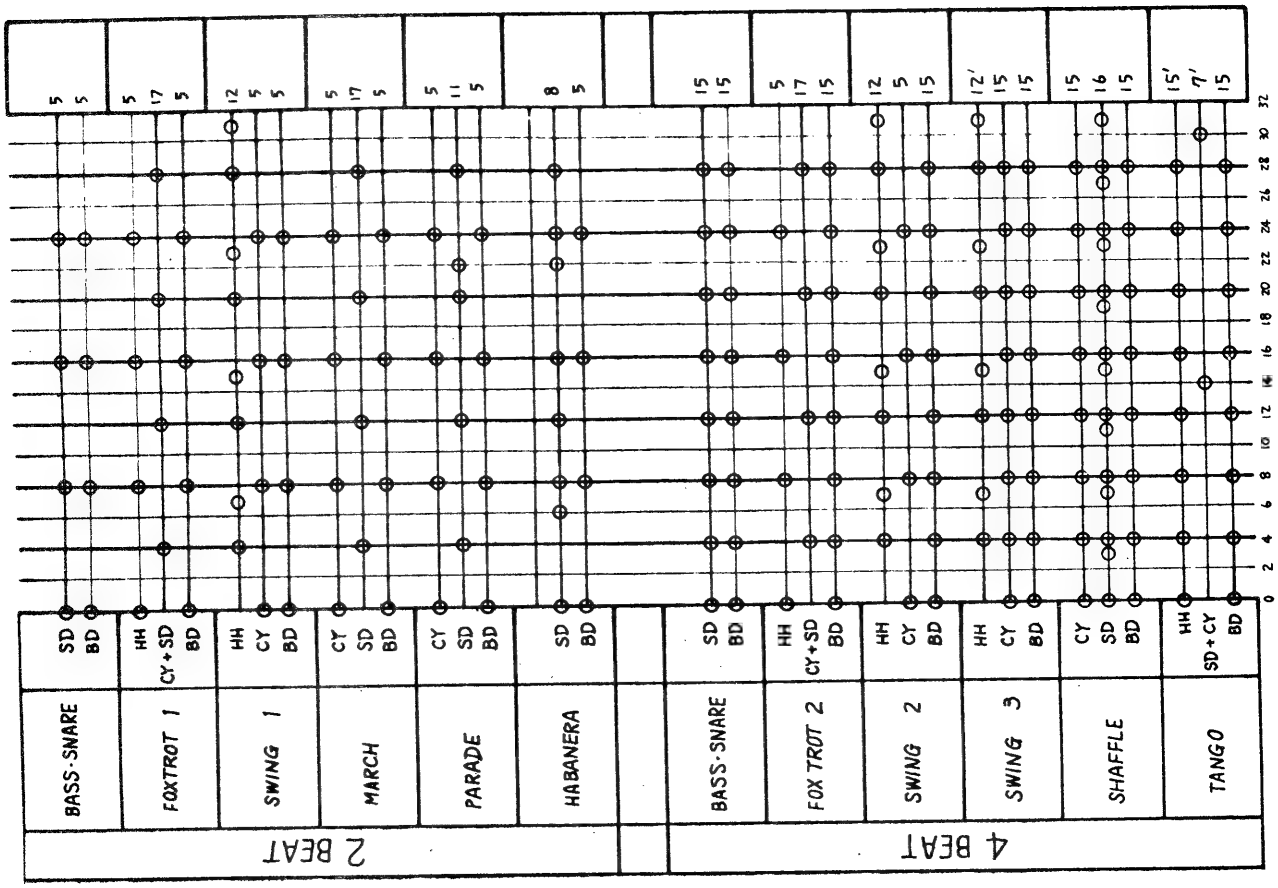

2 BEAT
4 BEAT
BASS-SNARE
FOXTROT 1
SWING 1
MARCH
PARADE
HABANERA
BASS-SNARE
FOX TROT 2
SWING 2
SWING 3
SHAFFLE
TANGO
SD BD
HH CY+SD BD
HH CY BD
CY SD BD
CY SD BD
SD BD
SD BD
HH CY+SD BD
HH CY BD
HH CY BD
CY SD BD
HH SD+CY BD
5 5
5 17 5
12 5 5
5 17 5
5 11 5
8 5
15 15
5 17 15
12 5 15
12' 15 15
15 16 15
15' 7' 15

Fig. 15

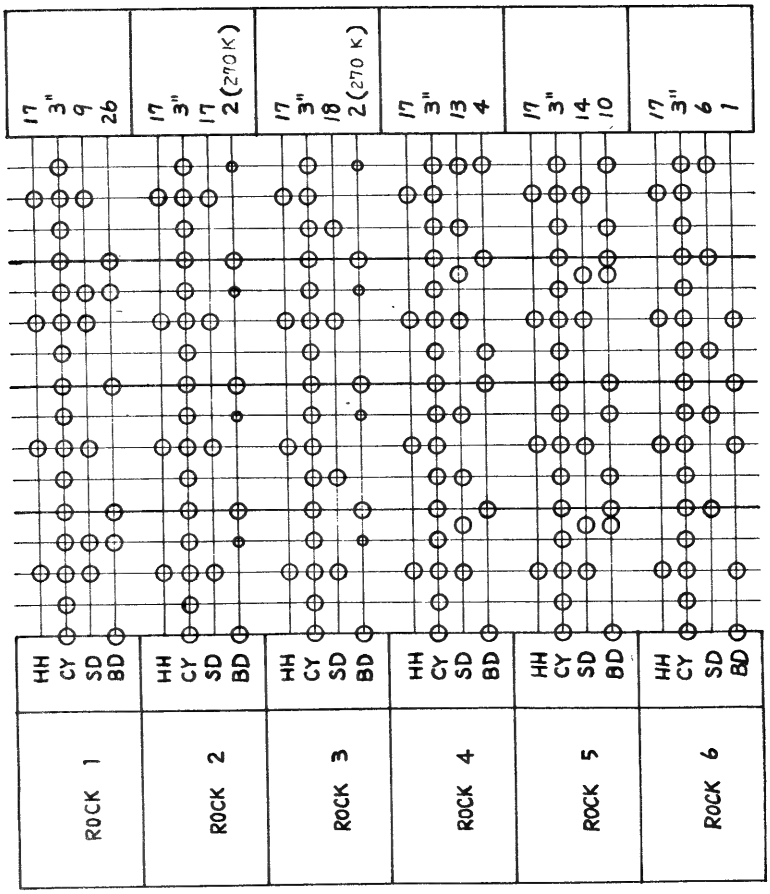
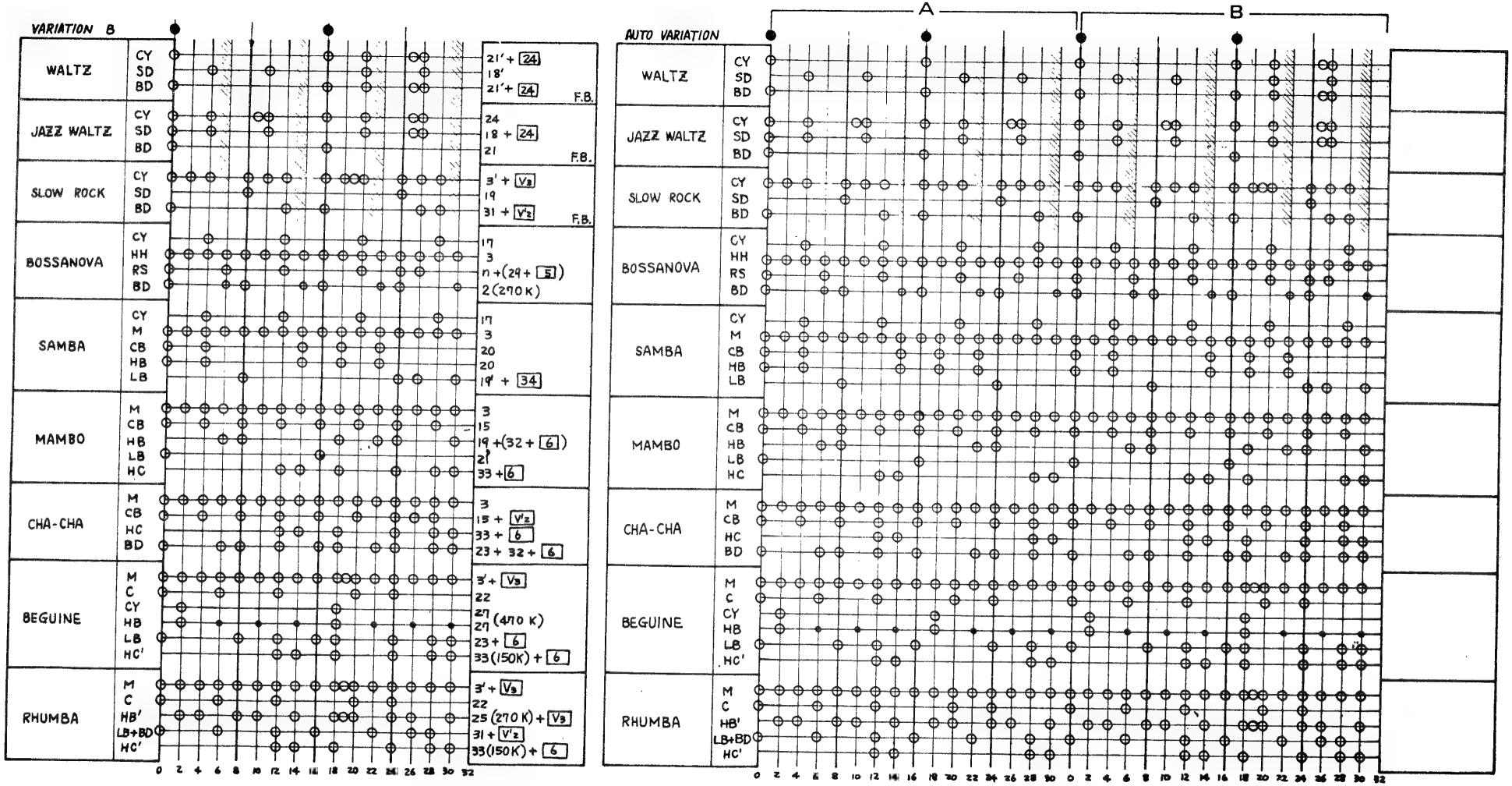

ROCK 1
ROCK 2
ROCK 3
ROCK 4
ROCK 5
ROCK 6
HH CY SD BD
17 3" 9 26
17 3" 17 2(270K)
17 3" 18 2(270K)
17 3" 13 4
17 3" 14 10
17 3" 6 1

Fig. 16


VARIATION B
WALTZ
CY SD BD
21'+ 24
18'
21'+ 24
F.B.
JAZZ WALTZ
CY SD BD
24
18 + 24
21
F.B.
SLOW ROCK
CY SD BD
3' + V3
19
31 + V'2
F.B.
BOSSANOVA
CY HH RS BD
17
3
n+(29+ 5)
2(270 K)
SAMBA
CY M CB HB LB
17
3
20
20
19' + 34
MAMBO
M CB HB LB HC
3
15
19+(32+ 6)
2?
33+6
CHA-CHA
M CB HC BD
3
15 + V'2
33 + 6
23+32+6
BEGUINE
M C CY HB LB HC'
3'+ V3
22
27
27 (470 K)
23+ 6
33(150K)+6
RHUMBA
M C HB' LB+BD HC'
3'+ V3
22
25 (270 K)+ V3
31+ V'2
33(150K)+6
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32
AUTO VARIATION
A
B
WALTZ
CY SD BD
JAZZ WALTZ
CY SD BD
SLOW ROCK
CY SD BD
BOSSANOVA
CY HH RS BD
SAMBA
CY M CB HB LB
MAMBO
M CB HB LB HC
CHA-CHA
M CB HC BD
BEGUINE
M C CY HB LB HC'
RHUMBA
M C HB' LB+BD HC'
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32

M = HH

Fig. 17

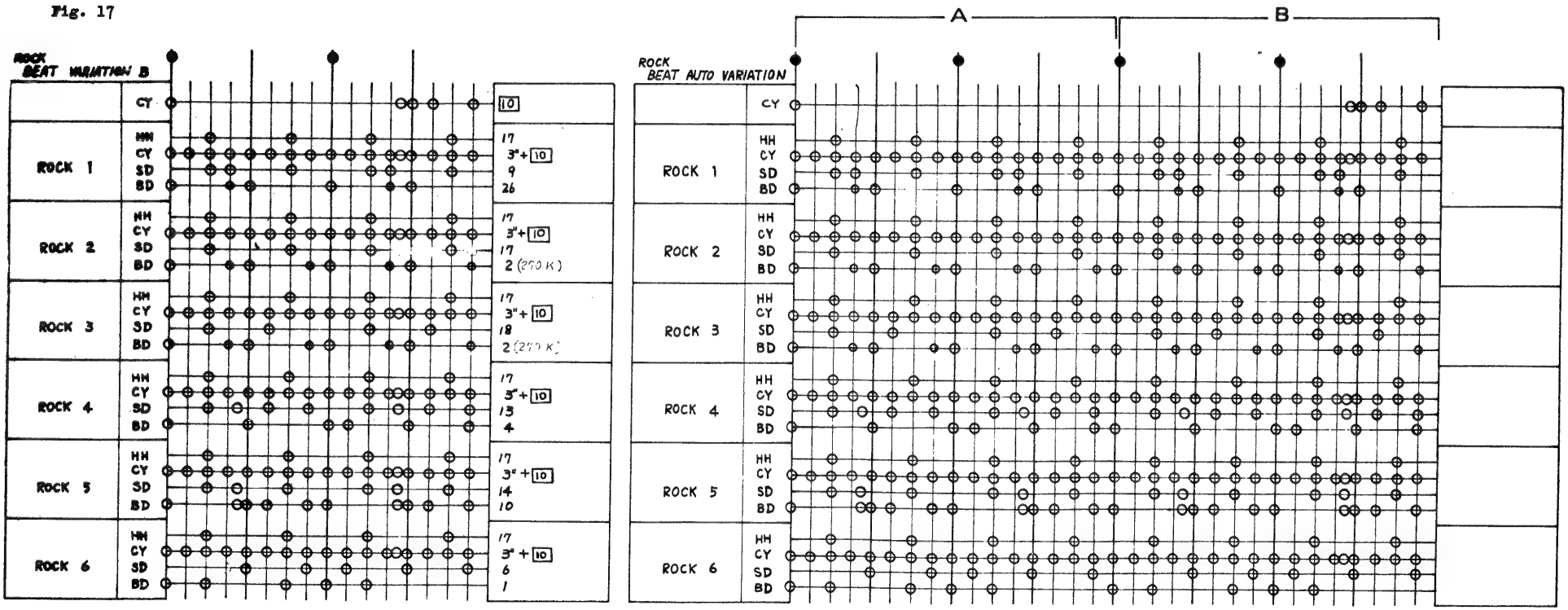
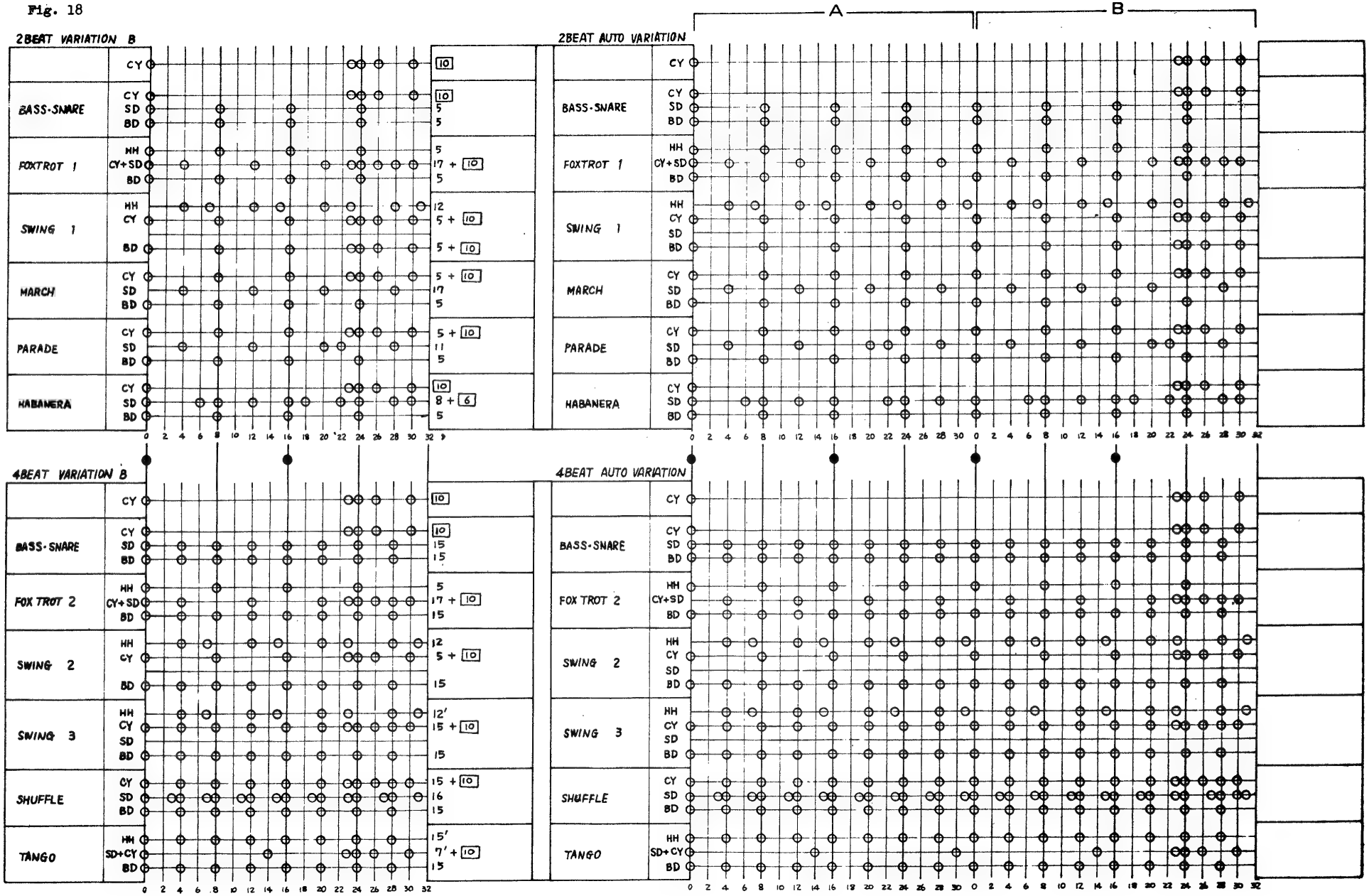

ROCK BEAT VARIATION B
CY
ROCK 1
HH
CY
SD
BD
ROCK 2
ROCK 3
ROCK 4
ROCK 5
ROCK 6
10
17
3"+10
9
26
17
3"+10
17
2 (270 K)
17
3"+10
18
2 (270 K)
17
3"+10
13
4
17
3"+10
14
10
17
3"+10
6
1
A
B
ROCK BEAT AUTO VARIATION

Fig. 18


2BEAT VARIATION B
2BEAT AUTO VARIATION
A
B
4BEAT VARIATION B
4BEAT AUTO VARIATION
BASS-SNARE
FOXTROT 1
SWING 1
MARCH
PARADE
HABANERA
FOX TROT 2
SWING 2
SWING 3
SHUFFLE
TANGO
CY
SD
BD
HH
CY+SD
SD+CY

SECTION 10. ADJUSTMENT

10-1. Logic Circuit

10-1-1. Adjustment of tempo speed by using oscilloscope

10-1-2. Rating

At oscillation period of Master Oscillator (Q1, Q2)

37.5mS (Quick) - 300mS (Slow)

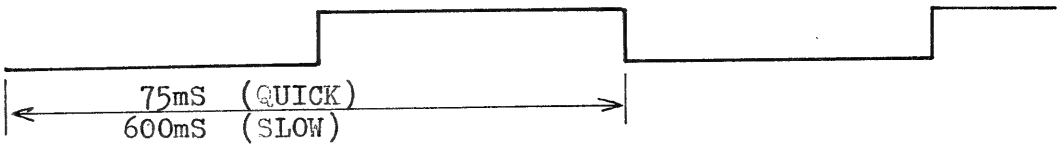
10-1-3. Procedure

See the wave form on the collectors of Q6 on the first stage flip-flop (Q5 and Q6).

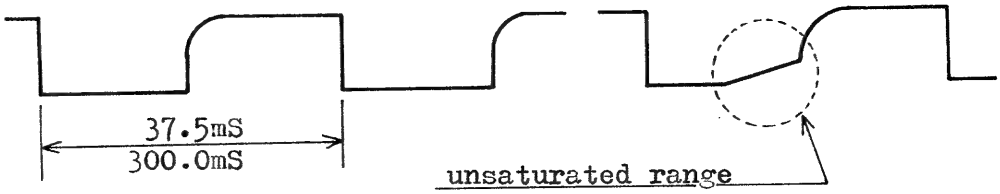
a) Turn the Tempo control full clockwise (Quick), and adjust the trim-pot VR1 so that the period of one cycle of symmetric rectangular wave shows 75mS.

b) Turn the Tempo control full counterclockwise (Slow), and adjust the trim-pot VR2 so that the period of one cycle of symmetric rectangular wave shows 600mS.

c) Repeat abovementioned procedures a) and b) to get desired values.



10-1-4. Wave form of the master oscillator (Q1 and Q2)

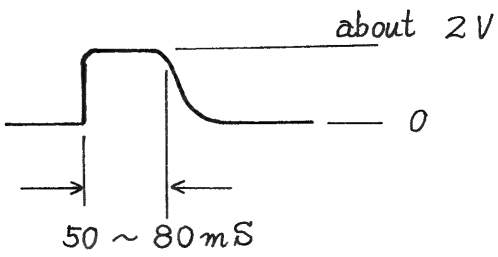


The period of master oscillator's output wave form is one-half of the period of the first stage flip-flop.

Be sure to confirm the wave form including no unsaturated range like the figure shown above right.

10-2. Tempo Lamp

See the wave form on the L terminal of Rhythm Switch Board Assembly RS-9 by the oscilloscope. And when the time value is otherwise, change the value of C10(4.7μ/25V) or R18(15 KΩ).



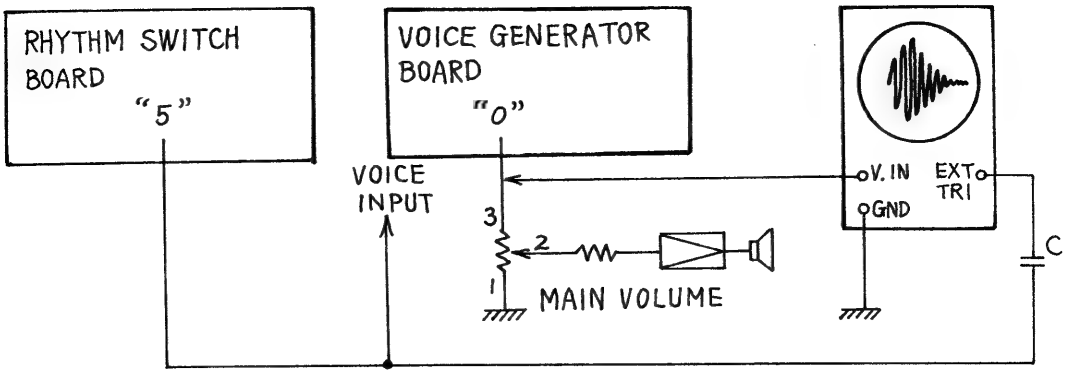
10-3. Voice Generator Circuit

STANDARD OUTPUT OF PERCUSSION INSTRUMENTS

	AMPLITUDE V			FREQUENCY mS Hz			DECAY TIME mS		
	MIN.	AVE.	MAX.	MIN.	AVE.	MAX.	MIN.	AVE.	MAX.
BD	1.6	2.1	2.7	18 (55.6)	16 (62.5)	14.3 (70)	65	100	140
HC	1.3	1.9	2.5	5.2 (192)	4.8 (208)	4.5 (222)	120	160	200
LB	0.6	1.0	1.5	2.6 (384)	2.5 (400)	2.25 (444)	20	40	60
HB	0.6	1.0	1.5	1.71 (571)	1.66 (600)	1.5 (666)	20	40	60
CB	1.5	2.0	2.5	1.3 (769)	1.2 (830)	1.12 (893)	20	35	50
RS	3.0	4.0	5.0	0.794 (1260)	0.676 (1480)	0.59 (1700)	3.5	5	7
C	1.0	1.5	2.0	0.5 (2000)	0.425 (2350)	0.4 (2500)	10	18	28
SD	-	-	-	-	-	-	-	-	-
	1.2	2.0	2.5	-	-	-	65	80	100
HH(M)	1.0	1.5	2.3	-	-	-	25	40	60
CY	1.2	$^{2.0}/_{0.5}$	2.5	-	-	-	350	400	600

10-3-1. Wave form on No.3 terminal of the main volume.

Provide the standard trigger pulse, output pulse on 5th terminal of the Rhythm Switch Board, for each input terminal of the voice generator. The period of the standard trigger pulse is generally 0.6sec. On actual adjustment, set the Tempo control on center position. In case that the amplifier is connected to the output jack (especially LOW), take down the main volume position of the Rhythm Arranger so that the input impedance of the amplifier connected don't affect the Voice Generator Circuit.



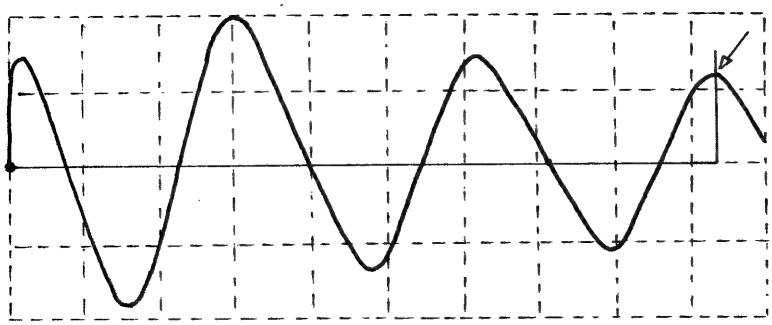
10-3-2. Adjustment of Drum section (BD, HC, LB, HB, CB, RS, C)

10-3-2-1. Adjustment of the Bass Drum

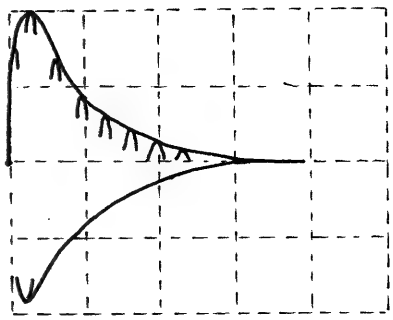
Connect a trigger pulse to the terminal "BD" on PCB, and adjust the trim-pot VR307 so as to get the decay time as 90mS.

And confirm that output voltage and frequency are within regular value.

When the frequency of BD is over or under the regular value, check the circuit constant,and change the capacitors C336-C338 and the resistors R345 R346. In case that capacitors or resistors or both are changed, repeat abovementioned adjustment.



5mS/div
1 V/div



50mS/div
1 V/div

10-3-2-2. Adjustment of the High Conga

Connect a trigger pulse to the terminal "HC" on PCB.

a) Adjustment of frequency

Adjust the trim-pot VR305 so as to make the frequency as 208Hz (4.8mS).

b) Adjustment of Decay time

Adjust the trim-pot VR306 so as to get the Decay time as 160mS.

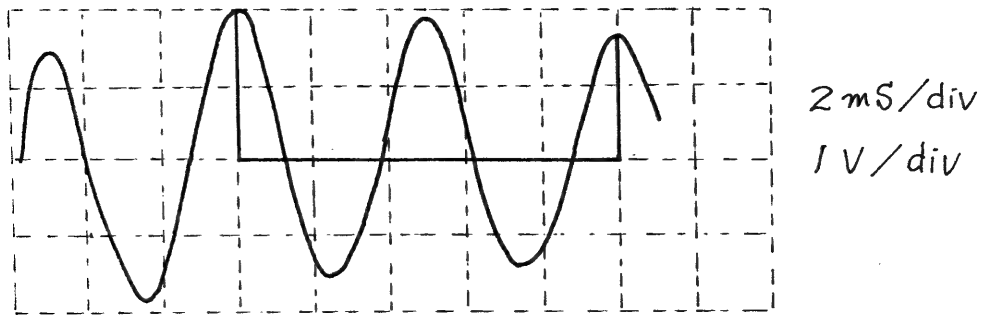
Repeat abovementioned adjustment.

c) Adjustment of the output voltage

Check the output voltage within regular value.

When the output voltage of HC is over or under the regular value,

check the circuit constant, and change the resistors R341-R342. In case that capacitors or resistors or both are changed, repeat abovementioned adjustment.



10-3-2-3. Adjustment of the Low Bongo

Connect a trigger pulse to the terminal "LB" on PCB.

a) Adjustment of frequency

Adjust the trim-pot VR303 so as to make the frequency as 400Hz (2.5mS).

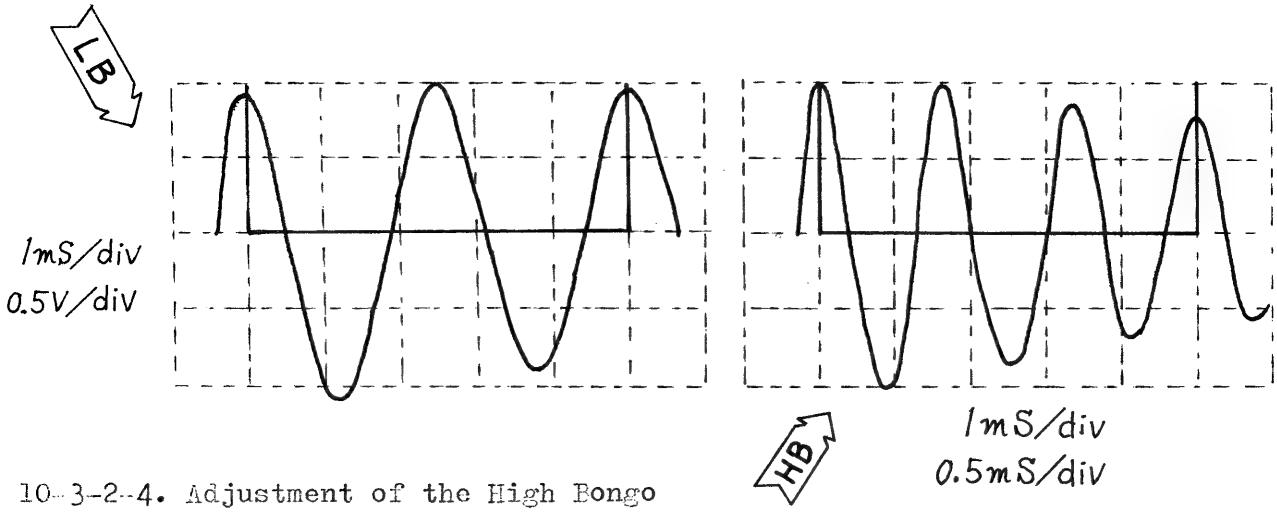
b) Adjustment of Decay time

Adjust the trim-pot VR304 so as to get the Decay time as 40mS. Repeat abovementioned adjustment.

c) Adjustment of the output voltage

Check the output voltage within regular value.

When the output voltage of LB is over or under the regular value, check the circuit constant, and change the resistors R330-R331. In case that capacitors or resistors or both are changed, repeat abovementioned adjustment.



10-3-2-4. Adjustment of the High Bongo

Connect a trigger pulse to the terminal "HB" on PCB.

a) Adjustment of frequency

Adjust the trim-pot VR301 so as to make the frequency as 600Hz (1.66mS).

b) Adjustment of Decay time

Adjust the trim-pot VR302 so as to get the Decay time as 40mS. Repeat abovementioned adjustment.

c) Adjustment of the output voltage

Check the output voltage within regular value.

When the output voltage of HB is over or under the regular value, check the circuit constant, and change the resistors R317-R318.

In case that capacitors or resistors or both are changed, repeat abovementioned adjustment.

10-3-2-5. Adjustment of the Cow Bell and the Rim Shot

Connect a trigger pulse to the terminal "RS" on PCB.

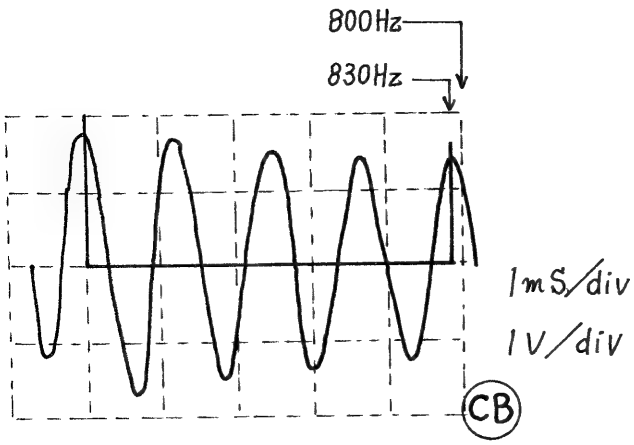
Ground the terminal "CB SHUNT" to get CB voice, and open the terminal for RS voice.

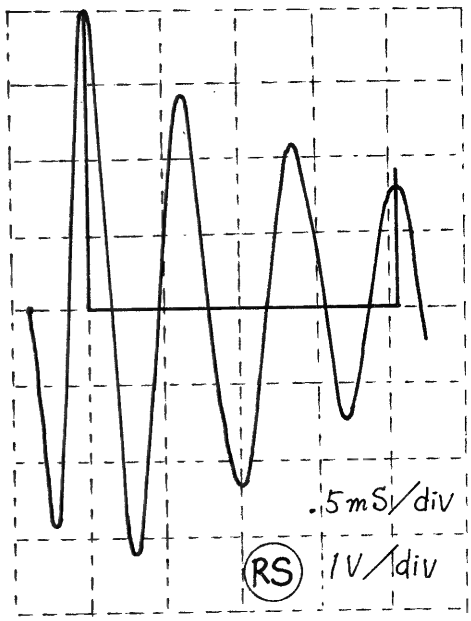
Check the output voltage, the frequency and the decay time within regular value.

Change the output voltage by changing circuit constant (R304, C307, C308 and C311).

Change the frequency by changing circuit constant (C309 and C310).

In case that circuit constant was changed, check the output voltage, the frequency and the decay time within regular value.





10-3-2-6. Adjustment of the Claves

Connect a trigger pulse to the terminal "C" on PCB.

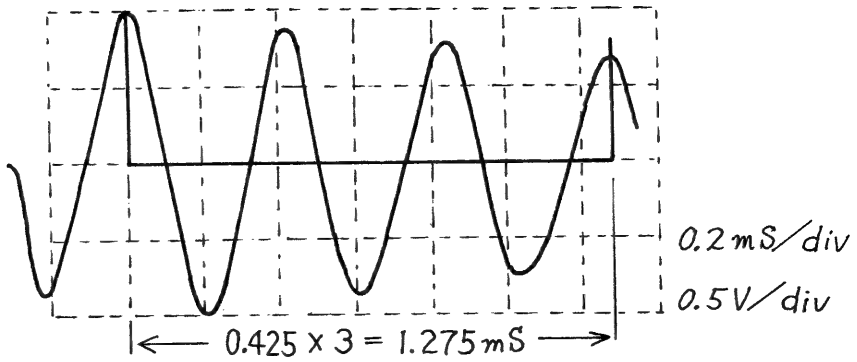
This circuit is adjustless like the CB's or the RS's.

Check the output voltage, the frequency and the decay time within regular value.

Change the output voltage by changing circuit constant (R302, C302, C303 and C305).

Change the frequency by changing circuit constant (C304).

In case that circuit constant was changed, check the output voltage, the frequency and the decay time within regular value.



10-3-3. Adjustment of noise section (HH, CY and SD)

10-3-3-1. Adjustment of the High-Hat

Connect a trigger pulse to the terminal "HH" on PCB.

Adjust the trim-pot VR308 so as to get the output voltage as 1.5V

And check the decay time within regular value.

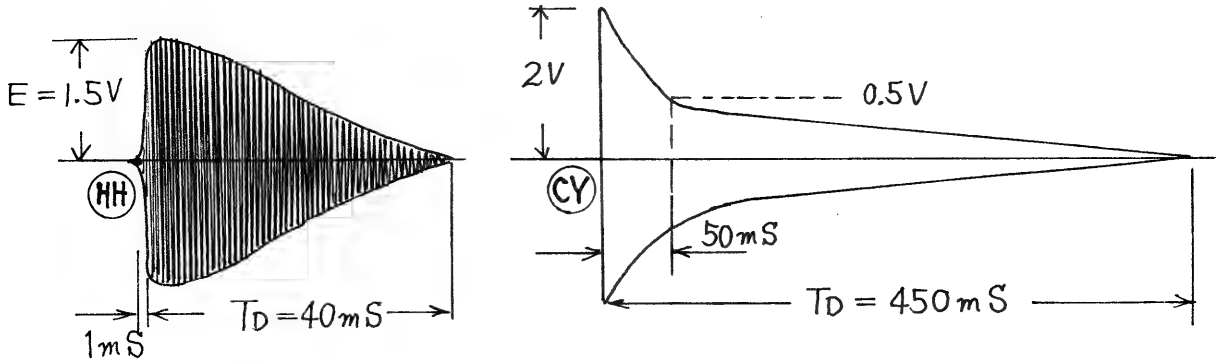
10-3-3-2. Adjustment of the Cymbal

Connect a trigger pulse to the terminal "CY" on PCB.

Check the output voltage within regular value.

Adjustor of the output voltage is the same trim-pot VR308 that for the High-Hat.

And check the decay time within regular value.



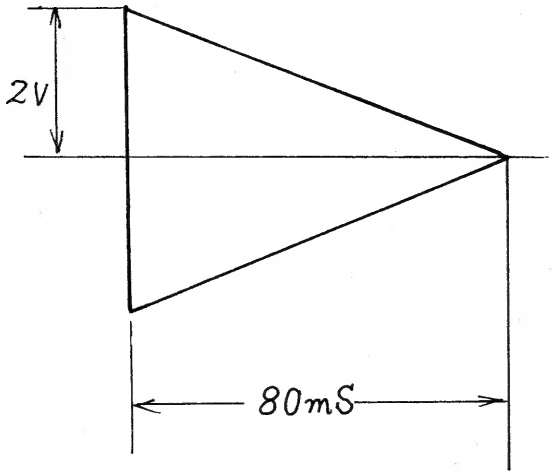
10-3-3-3. Adjustment of the Snare Drum

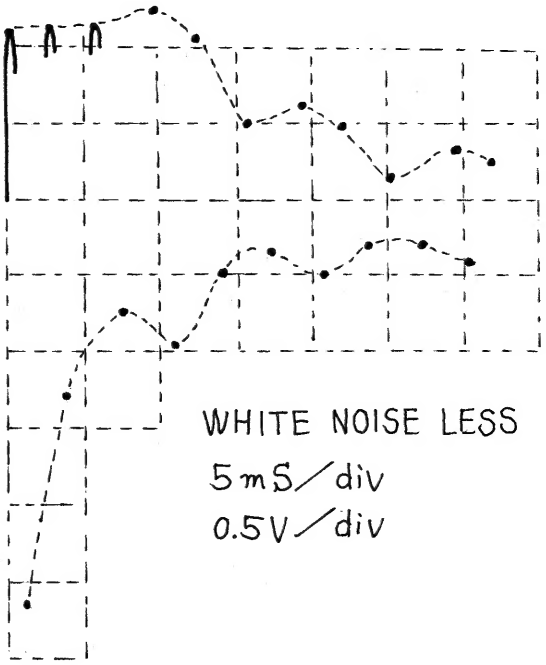
Connect a trigger pulse to the terminal "SD" on PCB.

Check the output voltage and the decay time within regular value.

Adjustor of the output voltage is the same trim-pot VR308 that for the High-Hat and the Cymbal.

The Snare Drum includes the weak sound of Low Bongo.


2V
80mS


WHITE NOISE LESS
5mS/div
0.5V/div

CABINET
CHASSIS ASSEMBLY

Chassis	No.27	(Main Chassis)	
"	No.28	(Rhythm Switch Chassis)	
"	No.29	(Rear Side : Black)	
Holder		(Lever Switch)	
Knob	TK-1112	(	
"	TK-1114		
Rotary Switch		ESR-E366K25	
Lever Switch		ESL-2412	
Keyboard Switch		S-J6471-01	
Key Top		S-J6292 A2	
Push Button Switch		10F0-0004DC2020	
"		3F0-0001DC2020	
Potentiometer		10K(B)S	EVC-B05K15 (Volume)
"		50K(B)	EVC-B0AK15 (Balance)
"		100K(B)	EVC-B0AK25 (Tempo)
Power Transformer		PT-50A-C	(0-100-120V)
"	or	PT-50A-D	(0-230-250V)
Jack		SG-7615	No.5
Fuse		0.25A	SGA0.250
Fuse Holder		TF-758	
Terminal Strip		2L6P	
Cord Bushing		R-5	
Long Nut		No.7 (52mm)	
P.C.B. Holder		LCBS-4N	
Light Emitting Diode			LD-64R
" Terminal Strip			L-3522-1P
Panel		No.40	

RHYTHM SWITCH ASSEMBLY RS-9 (MAIN)
" RS-6
VOICE GENERATOR BOARD ASSEMBLY VG-5

SEMICONDUCTORS
IC

Silicon Transistor	2SC828R
"	2SC828R (White Noise)
"	2SC536F or 2SC828R
"	2SC732GR or 2SC828R
"	2SC900F or 2SC1000GR
Silicon Diode	1S2473 or 1S1555
"	1S1850 (Rectifier)
"	1S1850 (")
Voltage Regulator Diode	05Z13

COILS

Coil	0.7H	3R
Chock Coil	45mH	

RESISTORS

Trim-pot Resistor	500 ohm	EVL-R4X
"	10K ohm	"
"	50K ohm	"
Carbon Film Resistor	56 ohm	1/4 R
"	100ohm	"

Carbon Film Resistor	220ohm	1/4 R
"	470ohm	"
"	560ohm	"
"	1 Kohm	"
"	1.5Kohm	"
"	2.7Kohm	"
"	3.3Kohm	"
"	3.9Kohm	"
"	4.7Kohm	"
"	5.0Kohm	"
"	6.8Kohm	"
"	8.2Kohm	"
"	10 Kohm	"
"	15 Kohm	"
"	22 Kohm	"
"	33 Kohm	"
"	39 Kohm	"
"	47 Kohm	"
"	56 Kohm	"
"	68 Kohm	"
"	82 Kohm	"
"	100Kohm	"
"	150Kohm	"
"	180Kohm	"
"	220Kohm	"
"	270Kohm	"
"	330Kohm	"
"	390Kohm	"
"	470Kohm	"
"	560Kohm	"
"	680Kohm	"
"	820Kohm	"
"	1 Mohm	"
Carbon Solid Resistor	56 ohm	ERC12GK
"	68 ohm	"
"	220 ohm	"
"	560 ohm	"
"	1 Kohm	"
"	2.2Mohm	"
"	6.8Mohm	"

CAPACITORS

Ceramic Capacitor	100 pfd	50V
"	250 pfd	"
"	470 pfd	"
Ceramic or Plastic Film Capacitor	1000pfd	50V
"	2200pfd	"
"	3300pfd	"
Plastic Film Capacitor	.0047mfd	50V
"	.0068mfd	50V
"	.0082mfd	"
"	.01 mfd	"
"	.012 mfd	"
"	.022 mfd	"
"	.033 mfd	"
"	.039 mfd	"

MODEL TR-66 PARTS LIST

Plastic Film Capacitor	.047mfd	50V	
"	.068mfd	"	
"	.1 mfd	"	
"	.15 mfd	"	
Electrolytic Capacitor	1 mfd	50V	
"	4.7 mfd	25V	
"	10 mfd	16V	
"	47 mfd	16V	
"	100 mfd	6.3V	
"	100 mfd	16V	
"	470 mfd	25V	
Tantalum Capacitor	.47 mfd	35V	K